HEAVY ION FUSION PROGRAM

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Accelerators have long been considered attractive options for inertial fusion energy because of durability, pulse repetition rate, and robustness of final focus magnets to target neutrons, x-rays, and debris. In addition, heavy ion beams can penetrate the vapor pressure of thick liquid protected chambers, enabling chambers lasting 30 years or more. There are three types of heavy ion fusion (HIF) targets that set requirements on the accelerator: indirect drive, direct drive (polar drive with shock ignition), and direct drive fast ignition (X-target). A tri lab consortium of LBNL, LLNL, and PPPL heavy ion research programs have recently focused intense, space-charge dominated heavy ion beams both transversely and longitudinally in the existing Neutralized Drift Compression Experiment-I, while a new larger version, NDCX-II, is being readied for operation beginning of 2012 to test scaled beam compression and focusing relevant to HIF-IFE. In addition, the High Current Experiment (HCX), is planned to be modified to test dynamic vacuum control at 5 Hz.

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